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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/680,228	10/06/00	ELLIS J	454313-2340.

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EXAMINER	
FOLEY, S	
ART UNIT	PAPER NUMBER
1648	12

DATE MAILED: 10/02/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No.	Applicant(s)	
	09/680,228	ELLIS ET AL.	
	Examiner	Art Unit	
	Shanon A. Foley	1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-81* is/are pending in the application.

4a) Of the above claim(s) *4-6,8,12-16,30,34-36,38,42 and 65-81* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7,9-11,17-29,31-33,37,39-41 and 43-64* is/are rejected.

7)☒ Claim(s) *2,3,7,32,33 and 37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group V in Paper No. 10 is acknowledged. The traversal is on the ground(s) that a search for all groups does not pose a serious search burden and overlapping searches would be required if the groups remain separated. Applicant further argues that all the groups have a single inventive concept in common and share a special technical feature. Applicant concludes that the restriction requirement is not proper because the restriction requirement failed to show serious burden or lack of unity. Applicant suggests that groups V and VI, drawn to a vector expressing a PCV-2 immunogen and a vector expressing a PCV-2 epitope be rejoined.

Applicant's arguments have been fully considered, but are not found persuasive because the search for each of the 15 groups is not co-extensive. Groups I-XII, XIV, and XV constitute different inventions for the following reasons: the polynucleotides, polypeptides, and antibodies, are chemically distinct products unrelated in sequence and are separately classified having separate fields of search. The independent products of groups I-XII, XIV, XV and XIII could be synthesized by chemical methods, isolated from cell culture, or recombinant technique and then combined with a pharmaceutical carrier. All of these various methods would have to be searched in the prior art, which includes worldwide patent and non-patent literature for each group of different and distinct compositions in order to ensure that the claims are free of art. This search for prior art does not preclude analyzing each claim under the various legal statutes to determine patentability. Furthermore, the Office only allots so much time that can be devoted to each case to conduct a thorough search for prior art and analysis of each claim under the various legal

statutes. For these reasons, an undue burden would be required of the Office and the Examiner if all 81 claims and 15 groups were reunited. Applicant should be aware that in US restriction practice, special technical features and unity of invention do not apply for distinguishing separate inventions. Groups V and VI are to remain separated because although they are both vectors, the immunogen or epitope they express are distinctly different entities and the prior art searches for both do not overlap. Although immunogens comprise epitopes, an antibody elicited by a specific PCV-2 epitope is so specific that the antibody that binds to a particular epitope would not necessarily bind to any immunogen from PCV-2, and vice versa. The requirement is still deemed proper and is therefore made FINAL.

Claims 4-6, 8, 12-16, 30, 34-36, 38, 42, and 65-81 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No. 10. Claims 1-3, 7, 9-11, 17-29, 31-33, 37, 39-41, and 43-64, drawn to a vector expressing a PCV-2 immunogen are being examined, to the extent that they read on the elected invention.

Priority

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification (37 CFR 1.78). The foreign application claimed for priority in the oath, PCT/EP/0008781 is not listed in the first sentence of the specification or in the "Related Applications" section.

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in PCT/EP/0008781 on 8/28/2000. However, the serial number provided in the oath cannot locate the application. Applicant is either required to submit a copy of the application or provide further information that will aid in locating the application so that the benefit for priority to the foreign application can be determined.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Also, in the table on page 39, group (A) is listed twice. It is presumed that group (B) was also tested and that the second (A) is a typo. Applicant can amend the specification to fix the typo if both (A) and (B) were in fact tested in the example accompanied by a statement that no new matter is introduced with the correction.

Claim Objections

Claims 2, 3, 7, 32, 33, 37 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims elected for group V are drawn to a

composition comprising a vector expressing a PCV-2 immunogen already recited in the independent claims. The dependent claims fail to further limit the parent claims.

Claim 60 is objected to because the claim is dependent from claims 33 or 34. Claim 34 has been withdrawn from further consideration due to due the non-election of the group. Appropriate correction is required.

Double Patenting

Claims 4-6, 8, 34-38, 42, and 65-81 of this application conflict with claims 4-6, 8, 34-38, 42, and 65-81 of Application No. 09/583,350. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 9-11, 17-29, 31-33, 37, 39-41, 43-64 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over

claims 87, 90-97, 100, 102-109 of copending Application No. 09/161,092. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in the instant application are drawn to an immunogenic composition comprising a vector expressing a PCV-2 immunogen that can be the entire PCV-2 virus, and another pig pathogen that is used to treat and/or prevent PCV-2 disease. The claims in '092 are drawn to an immunogenic composition comprising a nucleic acid expressing a PCV-II antigen and another pig pathogen. The PCV-II antigen in '092, denotes a different type of immune response, but since the components in the compositions used for treating and preventing PCV-2 disease is identical in both applications, the antigens and the immunogens in both applications are obvious to one another.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3, 7, 9-11, 17-29, 31-33, 37, 39-41, and 43-64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 31 recite "other pathologic sequelae associated with PCV-2". The claims and the specification fail to define what other pathologic sequelae are or how it is "associated" with PCV-2. This rejection affects all dependent claims.

Claims 9-11 and 39-41 are drawn to the PCV-2 immunogen being an entire porcine circovirus. Is the entire virus to be expressed recombinantly in a vector? Furthermore, claims 10 and 11 are drawn to the PCV being live or inactivated. If the virus is to be expressed in a vector, then the DNA expressing the virus cannot be alive or inactivated.

Claims 24-29 and 54-59 are vague and indefinite because the claims are drawn to the vector expressing certain ORFs, but do not state where these ORFs are derived from.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 7, 9-11, 17-29, 31-33, 37, 39-41, 43-64 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

The claims are drawn to an immunogenic or vaccine composition comprising vector that expresses a PCV-2 immunogen to treat or prevent PCV-2-caused myocarditis, abortion, intrauterine infection, post-weaning multisystemic wasting syndrome (PMWS) and/or any other "pathologic sequelae associated with PCV-2". The specification fails to define how the undefined "pathologic sequelae" is associated with PCV-2 and also fails to define every possible immunogen capable of eliciting a humoral and/or cell-mediated immune response to PCV-2. The examples drawn to detecting PCV-2 in piglets by PCR and immunohistochemistry and immunizing the piglets with vectors expressing ORF 4 or 13. The data analyzed from the

examples include bronchial lymphadenopathy, viral titer, and the amount of PCV-2 DNA. This data is indicative of the result of an immune response, not the nature of the immune response itself. An immunogen is capable of eliciting a humoral antibody and/or cell-mediated immune response; see the dictionary citation provided from Cruse et al. (Illustrated Dictionary of Immunology. 1995. CRC Press, Inc., page 156). There is no data analyzed in the specification that would indicate that an antibody response was made or that T cells were activated upon administration of the vectors expressing ORF 4 or 13 from a strain of PCV-2. Furthermore, although the specification identifies 13 ORFs from one strain of PCV-2 on page 24, there is no teaching in the specification indicating that any of these ORFs are immunogens. There is no teaching that would enable the skilled artisan to identify a common structure that would elicit the type of immune response an immunogen is capable of eliciting. Therefore, due to the number possible PCV-2 immunogens that may elicit a humoral and/or cellular immune response in pigs that may or may not be directly derived from PCV-2 and the lack of guidance provided by the inventors as to the a possible common structure of every possible PCV-2 immunogen that is capable of eliciting the desired response and the lack of data in the examples demonstrating that a humoral and/or cellular immune response was elicited with the vectors administered, it is clear that applicant was not in possession of all immunogens to PCV-2.

Claims 1-3, 7, 9-11, 17-29, 31-33, 37, 39-41, and 43-64 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are drawn to an immunogenic or vaccine composition comprising vector that expresses a PCV-2 immunogen to prevent and/or treat PCV-2-caused myocarditis, abortion, intrauterine infection, post-weaning multisystemic wasting syndrome (PMWS), and/or any other "pathologic sequelae associated with PCV-2". The specification fails to define how the undefined "pathologic sequelae" is associated with PCV-2. Also, as discussed above, there is evidence that applicant was not in possession of all immunogens to PCV-2 due to the lack of guidance provided by the inventors as to the a possible common structure of every possible PCV-2 immunogen that is capable of eliciting the desired response, and the lack of data in the examples demonstrating that a humoral and/or cellular immune response was elicited with the vectors administered. The skilled artisan would be unable to predict the structure for any PCV-2 immunogen that would elicit the desired immune response.

Example II has provides evidence that PCV-2 can be transmitted vertically by detecting antibodies to PCV-2 by immunohistochemistry and PCV-2 DNA by PCR in neonatal piglets. Example 10 is drawn to administering a generic "plasmid" expressing ORF 13 or 4 and administering the ORF 13 plasmid to one group of 3-4 piglets and administering both plasmids to another group of 3-4 piglets on day 2. The example does not state whether the piglets were germ-free or colostrum-deprived. On day 14, some of the piglets (the example does not specify how many out of each group) either received a booster of the plasmid received on day 2 or a placebo. On day 21, the piglets were challenged with PCV-2. All of the piglets had bronchial lymphadenopathy and there were only slight differences between the amount of viral titer and PCV-2 DNA detected in the treated and control groups. Due to the small number of total subjects in the experiment and the lack of data concerning how many received the placebo or the

booster, and the lack of any significant difference observed in the pathology of the treated and untreated piglets, it is determined that this example lacks enablement to treat and/or any PCV-2-associated disease or pathology with any generic plasmid expressing any ORF from PCV-2 or immunogen.

In example 11, small groups of 3-4 piglets received canarypox expressing PCV-2 ORF13 or a canarypox vector expressing PCV-2 ORF 4 and 13. The example does not specify how many of piglets in each group received a booster or a placebo, or what kind of piglets were used in the example. Nor does the example have data directed to whether the piglets elicited a humoral and/or cellular response to the vector that would indicate an appropriate response to an immunogen. The example also does not have any data related to the amount of viral titer, or viral DNA that was present at termination. The only data submitted at the conclusion of the experiment is whether or not the piglets had signs of bronchial lymph node enlargement. Although the results of this experiment are positive for a lack of this specific pathology for all of the piglets vaccinated, the small numbers in each group and the short period of time between vaccination and termination i.e. 24 days, would not indicate total prevention of all PCV-2 disease. Also, there was the lack of data collected for other evidence of PCV-2-associated disease, such as viral titer, viral DNA, myocarditis, intrauterine infection, PMWS, and abortion in adult pigs, that the skilled artisan would doubt that total prevention of any PCV-2 disease had been accomplished. Also, since the examples only administer the vectors to (PCV-2 naïve? colostrum-fed? germ-free?) piglets, and no adult pigs were administered the vectors, there is no way to predict how adult pigs with a fully developed immune system without maternal

antibodies present would react to the treatment. Further, there is no example drawn to treating infected pigs or demonstration of PCV-2 disease amelioration.

The prior art establishes a number of symptoms are associated with PCV-2, including PMWS, abortion, myocarditis, and intrauterine infection; see Allan et al. (J Vet Diagn Invest. 2000. 12: 3-14) and West et al. (J Vet Diagn Invest. 1999. 11: 530-532). It is still not known to date exactly what prompts some pigs to develop disease and not others. Allan et al. (Veterinary Record. 2000. 147 (6): 170-171.) teaches that PCV-2-associated PMWS has only been consistently reproduced in germ-free or colostrum-deprived piglets by co-administration of PCV-2 and porcine parvovirus and speculates about what other farming practices have been implemented that would induce the emergence of PCV-2-PMWS. Recently, Krakowka et al. (Vet Pathology. 2001. 38: 31-42.), teaches that piglets injected with PCV-2 alone are asymptomatic, but piglets that have been injected with PCV-2 in conjunction with an immune stimulant or another pig virus, developed PMWS. Krakowka et al. teaches that PCV-2 has been present since 1973 and suggests that the emergence of PMWS stemming from PCV-2 infection is a result of virus exposure to immunologically sensitive herds, see the last paragraph on page 41.

The level of predictability to one of ordinary skill in the art for vaccine development is low even with the knowledge of direct antigens that cause disease. In this case, the unexplained, sudden emergence of disease by a virus that has been around for a while and the fact that no one has been able to consistently produce disease with PCV-2 alone in colostrum-fed pigs without augmenting the immune response with an adjuvant or another pig pathogen, would not suggest to the skilled artisan that any immunogen derived from PCV-2 alone would treat or prevent disease.

Therefore, due to the broad scope of the claims drawn to treating any disease or syndrome associate with PCV-2 in any pig with any immunogen to PCV-2, the lack of guidance provided by the inventor drawn to identifying PCV-2 immuogens or what types of immune responses are elicited by these PCV-2 immunogens, the lack of guidance provided by the inventor as to how these immune responses aid in treating or preventing PCV-2 disease in any pig, the small number of total subjects in the experiments, the lack of description determining what type of piglets were administered the vectors, the lack of data concerning how many received the placebo or the booster, and the lack of any significant difference observed in the pathology of the treated and untreated piglets in example 10, the lack of data collected for other evidence of PCV-2-associated disease in example 11, the lack of examples drawn to treating infected pigs, the state of the art that fails to specifically point to the cause in the sudden emergence of PCV-2 disease, the lack of art teaching PCV-2 disease amelioration or prevention, the unpredictable nature of vaccine development, the lack of predictability for the skilled artisan to identify any PCV-2 immunogen used to treat or prevent PCV-2 disease, it is determined that undue experimentation would be required of one skilled in the art to treat and/or prevent any PCV-2-associated disease or pathology with any generic plasmid expressing any ORF from PCV-2 or immunogen.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shanon A. Foley whose telephone number is (703) 308-3983. The examiner can normally be reached on 7:30-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Housel can be reached on (703) 308-4027. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4426 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

Shanon Foley/SAF
September 28, 2001

James C. Housel
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